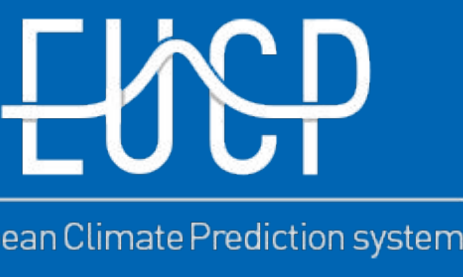


# Decadal Climate Predictions with EC - Earth at the BSC



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DCPP A

EC - Earth 3.3

Full Field Initialisation

**Current production of the decadal hindcast set for CMIP6**

- yearly start dates
- 1960 - 2017
- initialised on 1st November
- 10 ensemble members
- 10 simulation years

**Model Components:**

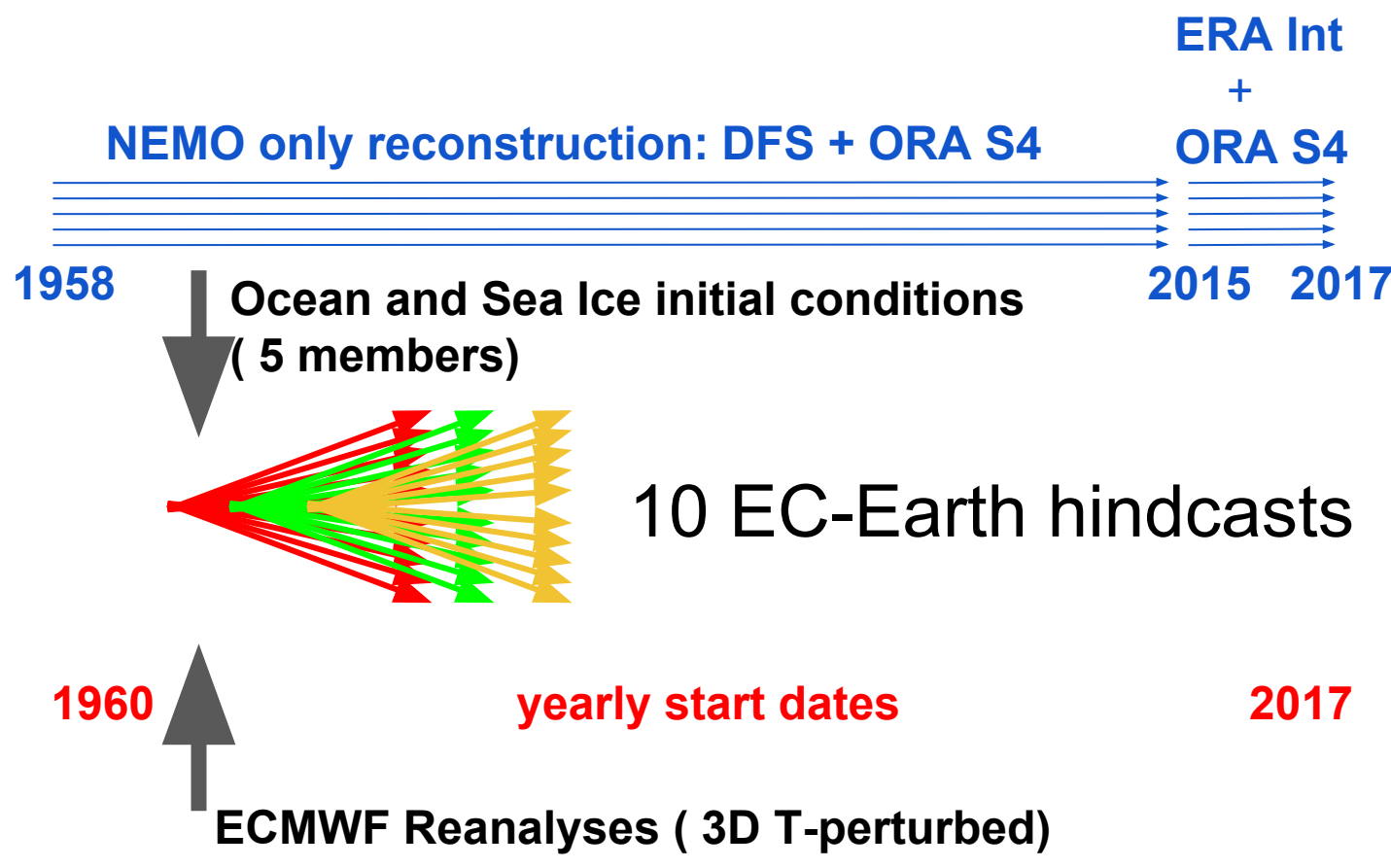
- Atmosphere: IFS, T255L91
- Ocean: NEMO, ORCA1L75
- Sea Ice: LIM3
- + OASIS coupler

Atmosphere:

ECMWF Reanalyses (ERA Int + ERA40) with GPCP-corrected land surface

Ocean and sea-ice reconstruction:

ICs are produced using a NEMO only simulation forced by DFS (ERA-I) fluxes and nudged towards ORA S4



Hindcast Verification (1960-2017) with previous Model Version EC - Earth 2.3

**Temperature:**

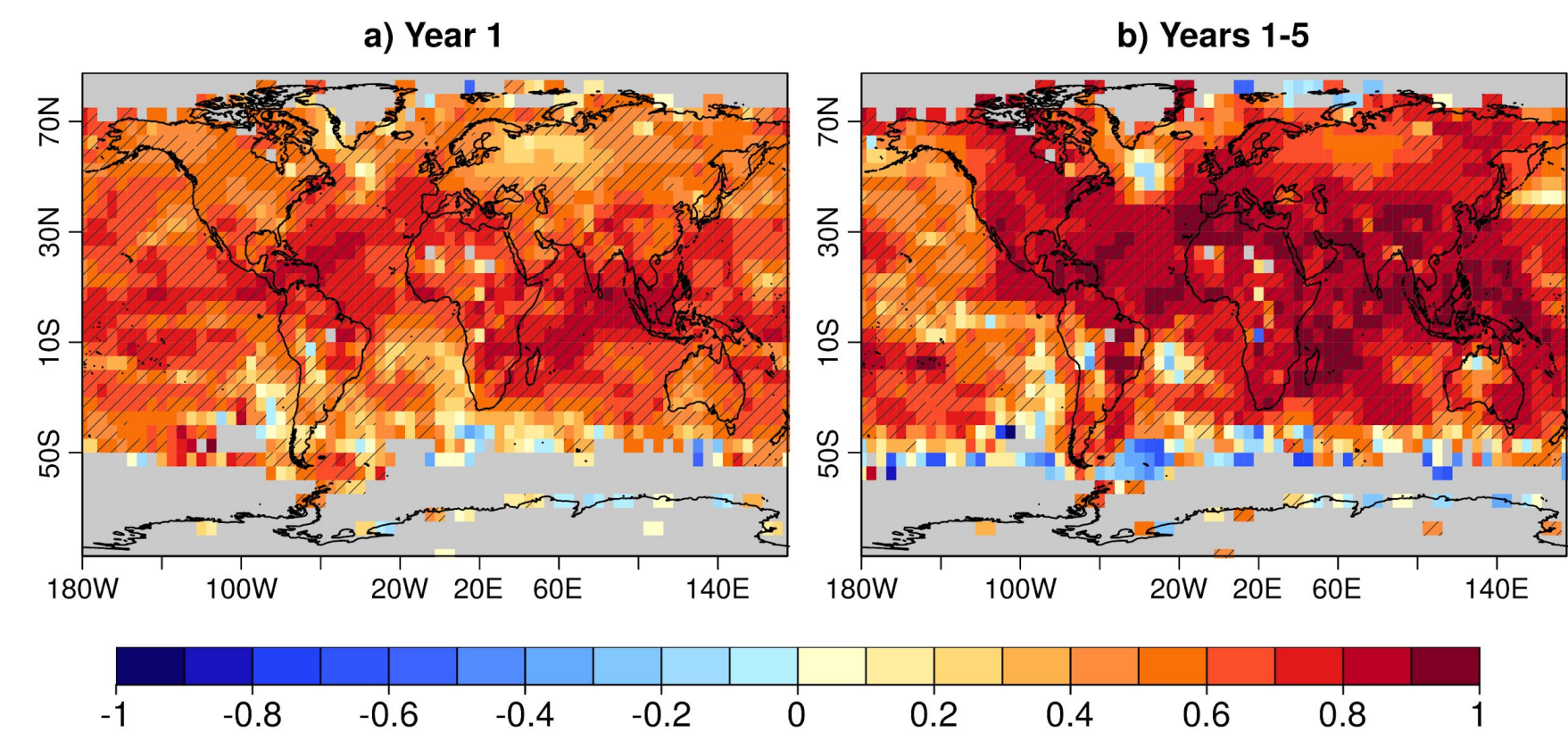


Fig.1: Anomaly correlation coefficients for near-surface temperature for a) forecast year 1 and b) average forecast year 1-5. The forecasts are verified against HadCRUT4. The stippled areas represent regions where the correlation is statistically significant at the 5% level.

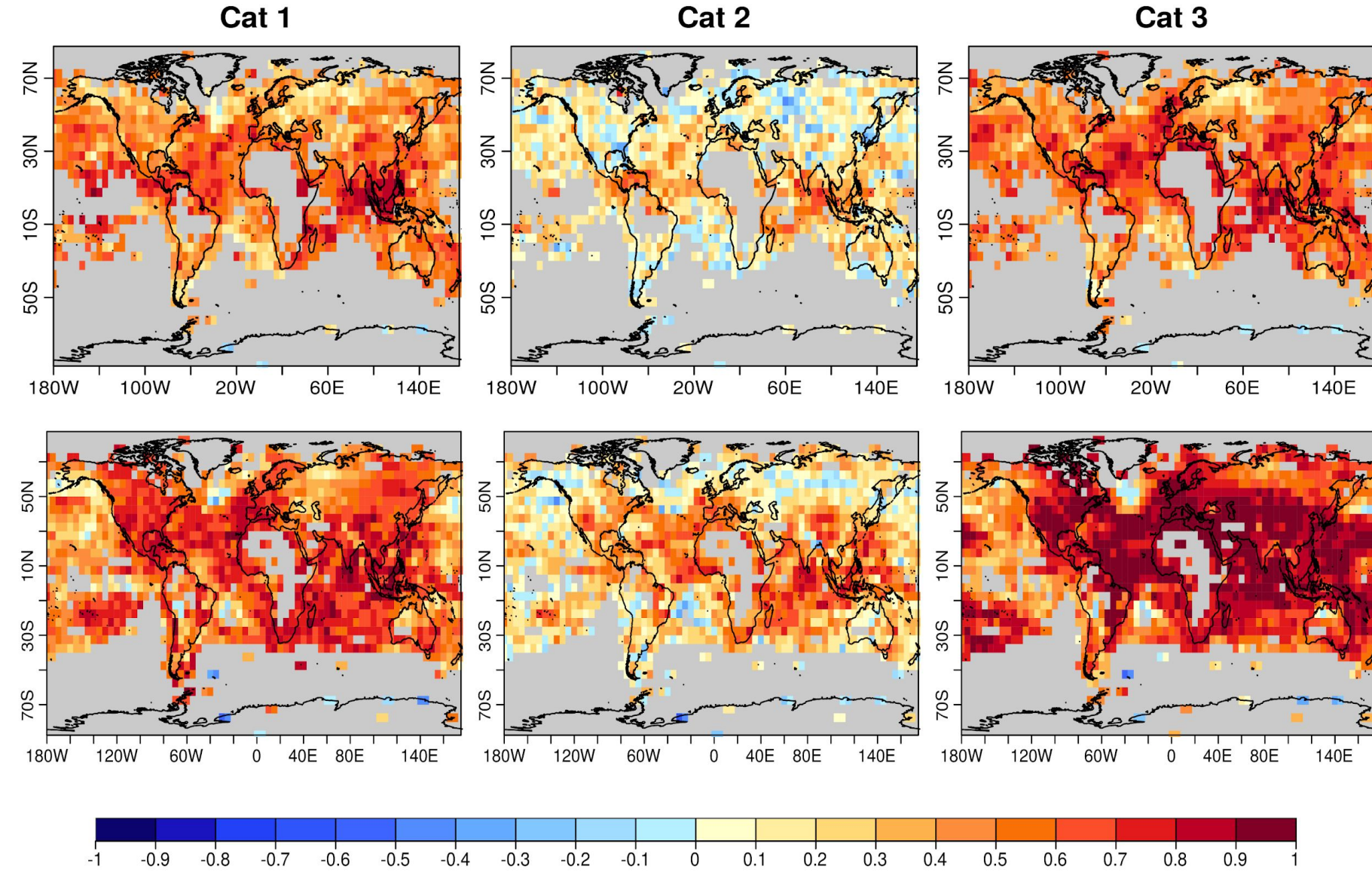


Fig. 2: Forecast year 1 (top row) and year 1-5 (bottom row) near surface temperature anomaly ROC skill score (ROCSS) for below-normal (left), normal (middle) and above-normal (right) terciles. The forecasts are verified against HadCRUT4.

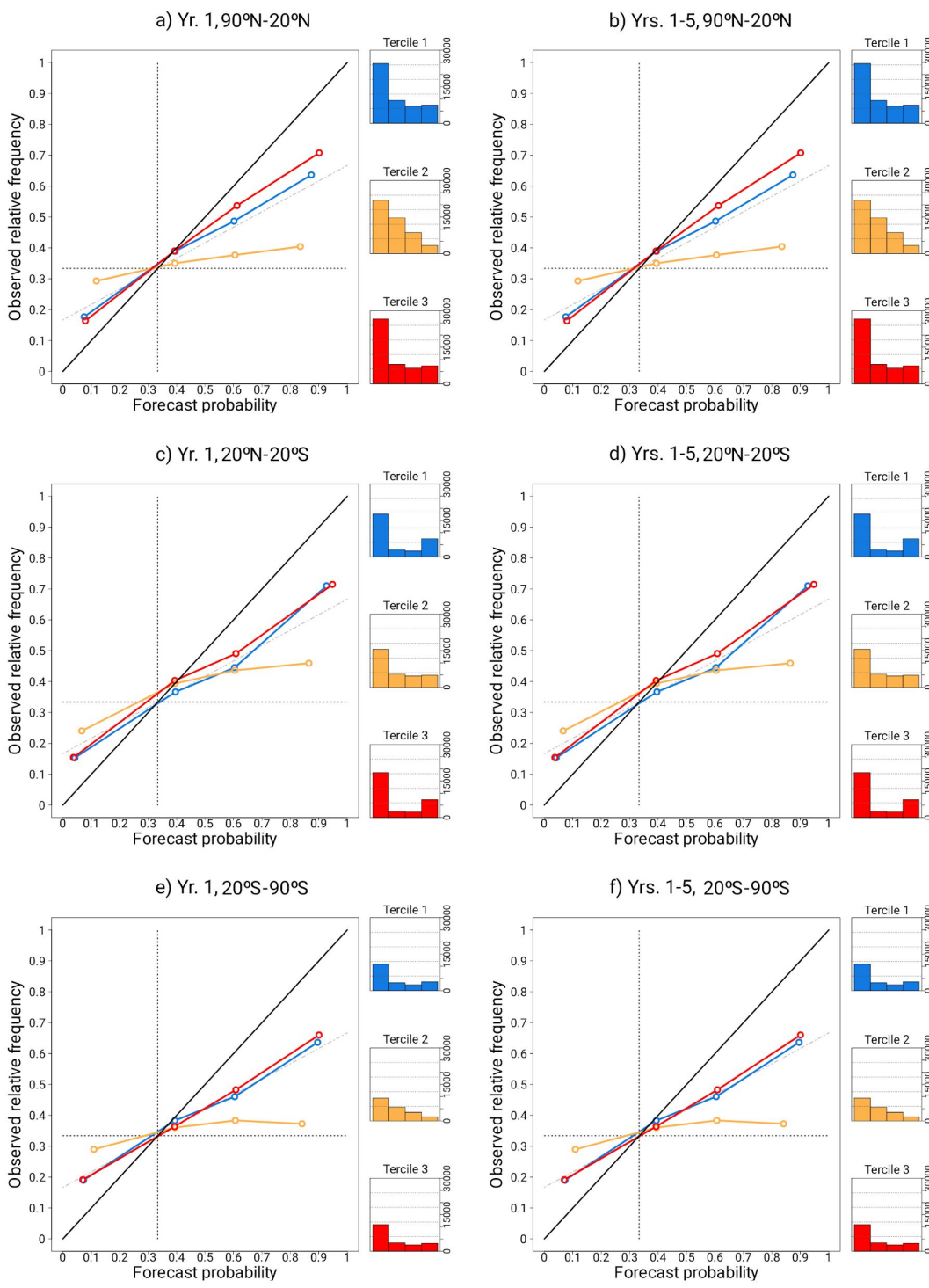


Fig.3: Near-surface temperature anomaly reliability diagrams, for forecast year 1 (left column) and average forecast year 1-5 (right column) for the region limited by top) 90N-20N middle) 20N-20S bottom) 20S-90S. For each diagram, three events are represented: above-normal (red), normal (orange) and below-normal (blue). The sharpness diagrams (smaller panels) show the predicted frequencies for each event and probability range. The diagonal line indicates perfect reliability. The dot-dashed line represents the no-skill line (forecasts below this line are not better than a climatological forecast).

**Mean Sea Level Pressure:**

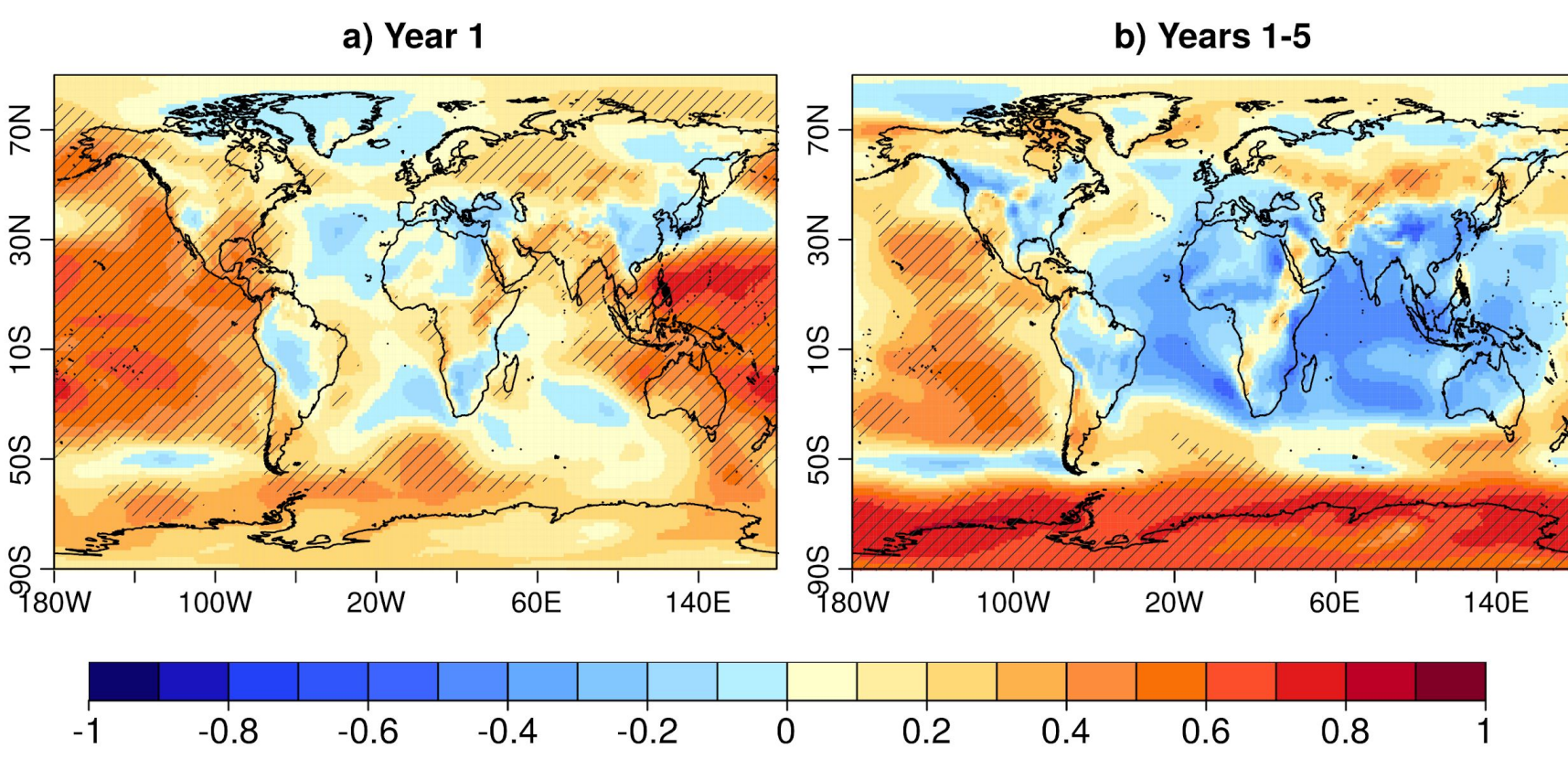


Fig.4: as figure 1 but for SLP

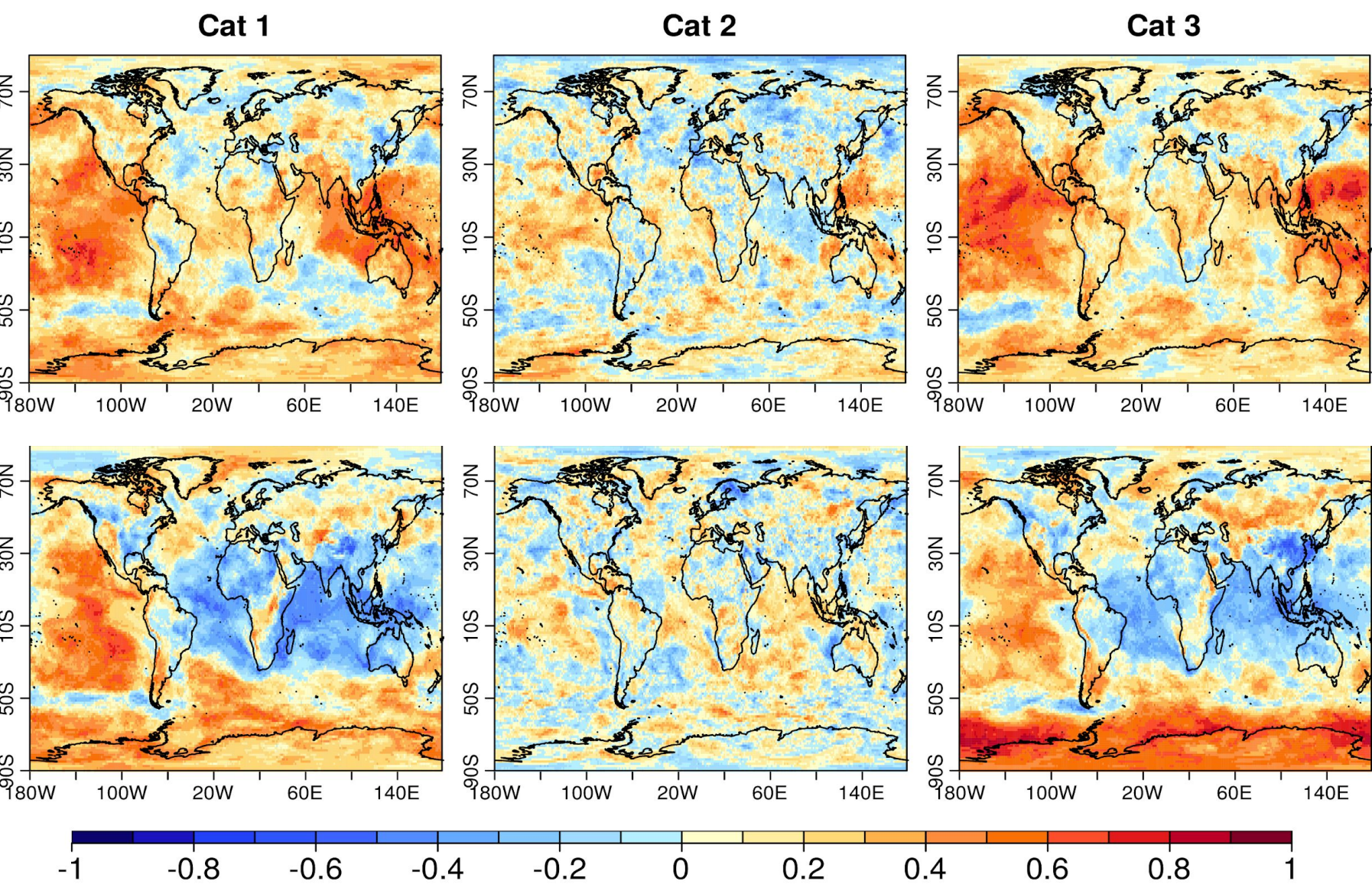


Fig. 5: as figure 2 but for MSLP

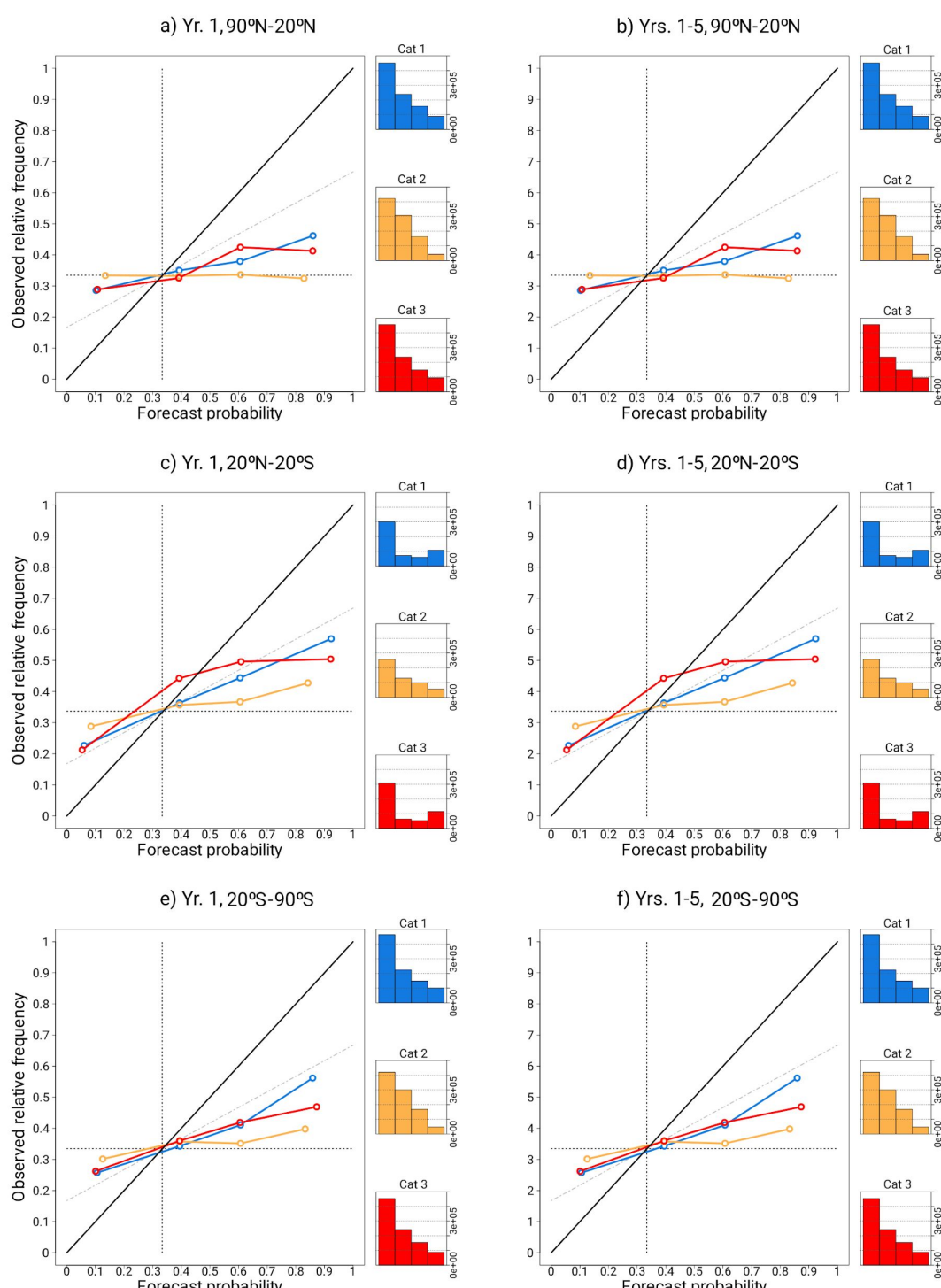


Fig.6: as figure 3 but for MSLP

**Precipitation:**

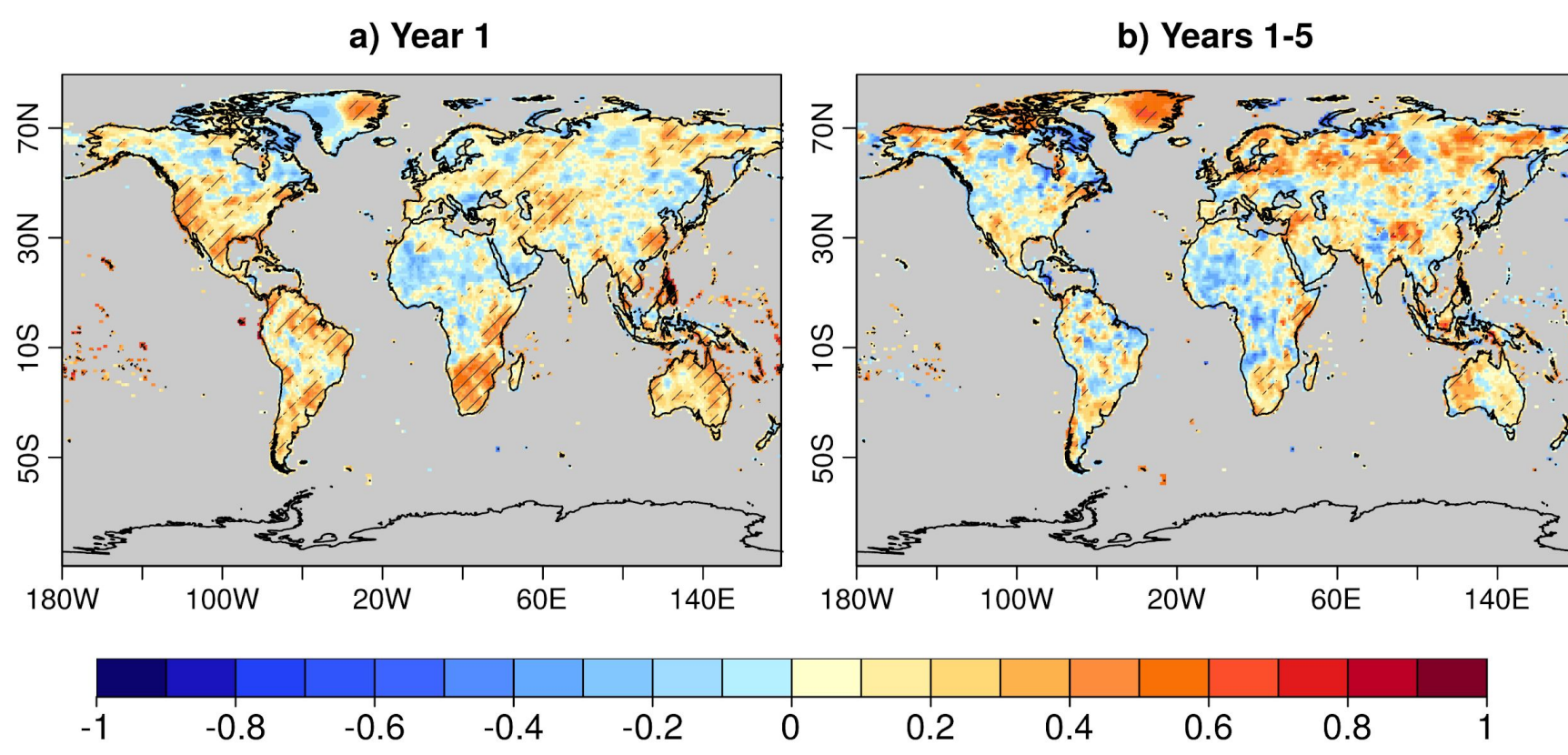


Fig.7: as figure 1 but for precipitation

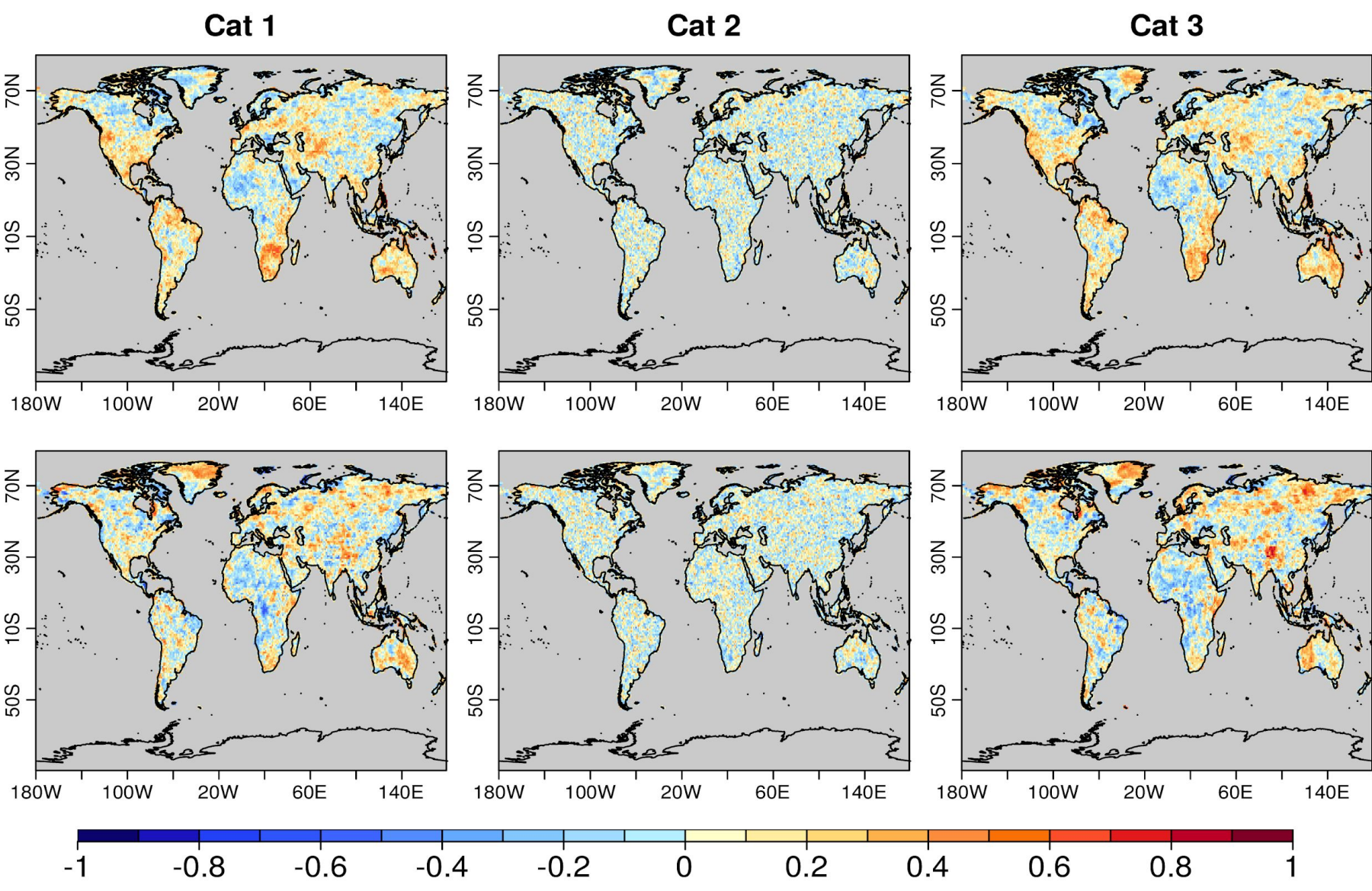


Fig. 8: as figure 2 but for precipitation

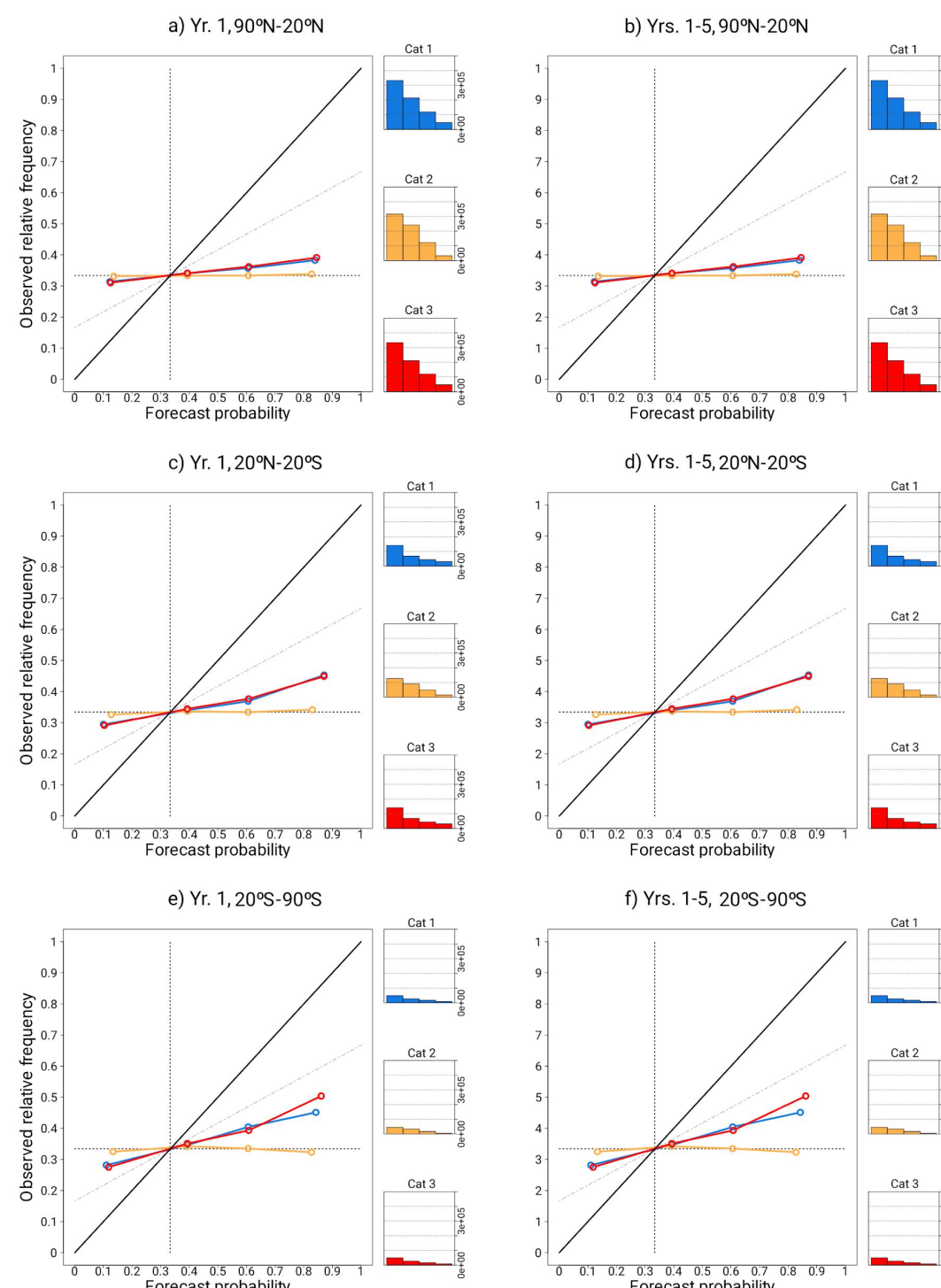


Fig.9: as figure 3 but for precipitation

Decadal Forecast November 2018

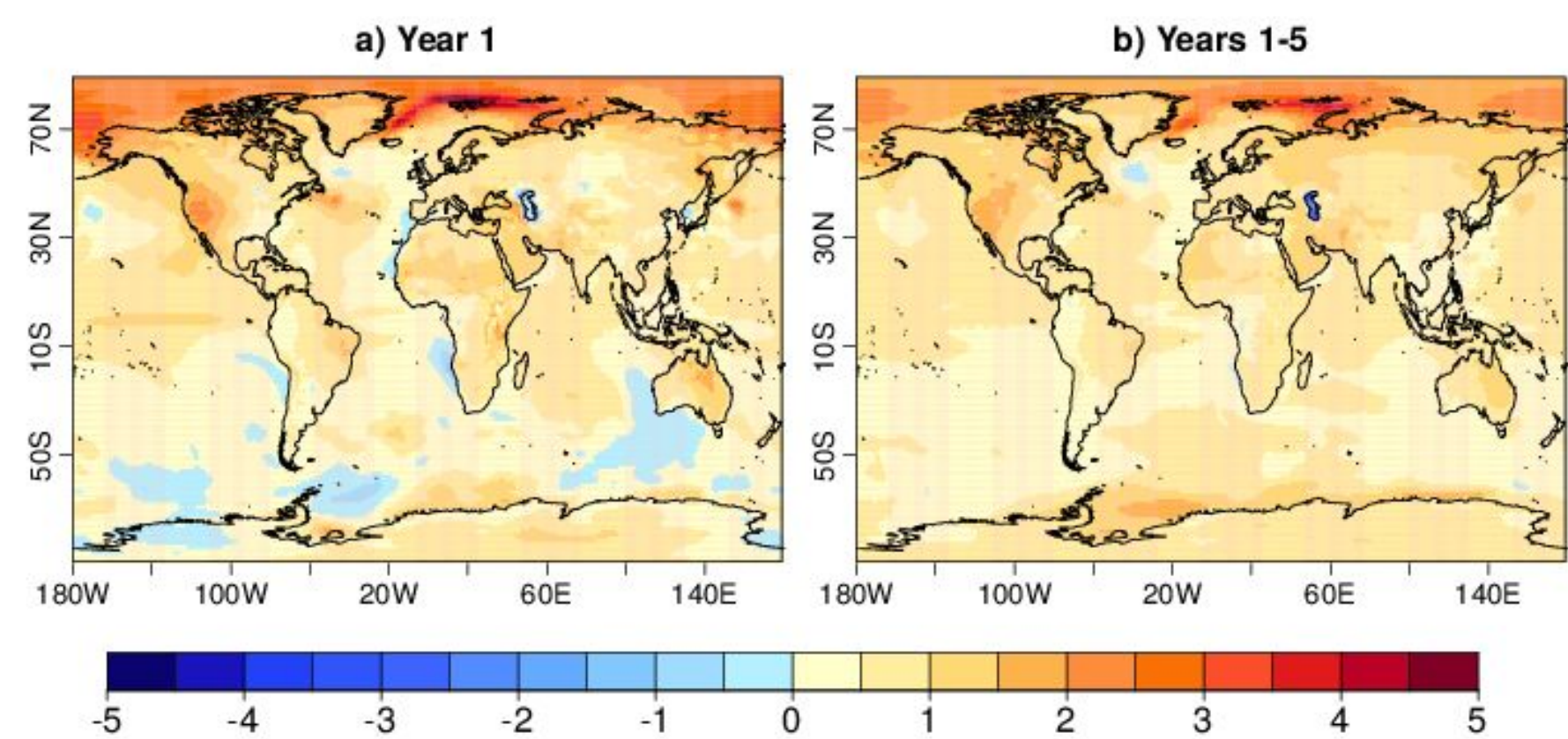


Fig.10: Mean near-surface temperature anomalies forecasted for a) November 2018 - October 2019 and b) November 2018 - October 2023.

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